

## 4.0 Environmental Consequences

This chapter assesses the environmental impacts that would be expected to occur from the implementation of alternatives A, B, C, and D as described in chapter 2. Environmental impacts are analyzed by issues for each alternative and appear in the same order as discussed in chapter 2. The terms “bike path” and “highway” reference independent transportation use proposals that have been submitted to the Service; for details see a discussion of these proposals in Appendices E and F.

### 4.1 Effects on the Physical Environment

This section describes the effects of each alternative on the physical environment, including geology, mineral resources, soils, water, and the Service’s ability to address climate change. Further effects on the physical environment that are applicable to all alternatives are discussed below in “Unavoidable Adverse Impacts.”

#### **Alternative A (No Action )**

If there is no change to the administrative boundary of the Refuge and the 300-foot-wide transportation corridor is disposed of via direct sale, the existing mineral lease on Section 16 may be exploited to extract marketable resources from the Rocky Flats Alluvium on that parcel. There would be a loss of productive soils on that parcel until mineral extraction is complete and the site has been reclaimed. There would also be a loss of productive soils within a portion of the 300 foot transportation corridor; the amount of loss would depend upon the amount of paved area in that 2.76-mile long parcel, but could range from 15 feet in width for a bike path up to nearly 300 feet for a highway with a multi-use path. Rights to the mineral resources under the 300-foot-wide transportation corridor would be transferred to the party receiving the surface rights, so there could be potential impacts to those resources as long as those uses do not interfere with the mandated use of the parcel for transportation improvements.

The 300-foot-wide transportation corridor includes 5,133 feet of streams and ditches. Besides the potential loss of wildlife habitat associated with those waterways if the corridor is developed, there is the potential for increased downstream sedimentation and turbidity of surface water as a result of ground disturbance and increased erosion via runoff. There may also be effects on water quality due to runoff from the impervious surface of new transportation facilities if constructed, and increased temperatures downstream. It was determined in the Rocky Flats NWR CCP/EIS (USFWS 2004a) that these impacts would not significantly affect the management of Rocky Flats as a wildlife refuge. Development of the 300-foot-wide parcel for transportation purposes would have to be performed in accordance with applicable local, State, and Federal regulations, including state radiation health standards that would be triggered by the disturbance of low-level residual plutonium in the soil as discussed in Appendix G.

Under this alternative, section 16 would remain available for future development which would isolate the Refuge from existing regional open space that runs along much of the foot of the Front Range. One of the primary ecological concerns of climate change is the potential for populations with genotypes that are adapted to specific environmental conditions to die out because they are isolated from the land that will have those conditions under future climate regimes (Loss et al. 2011). Future climate projections suggest a substantial increase in temperature with a slight decrease in precipitation, which would leave the Refuge

vulnerable to more intense and frequent wildfire in the future and exert selection on the existing biodiversity of the Refuge. In Colorado, average temperatures have increased about 2 degrees Fahrenheit (°F) in the past 30 years and future winter projections indicate fewer extreme cold months, more extreme warm months, and more strings of consecutive warm winters (National Research Council of the National Academies 2007; Western Water Assessment 2008). Alternative A would make it more difficult for the Service to manage Refuge resources and adapt to climate change.

### **Alternative B (Proposed Action)**

Under this alternative, the mineral lease held on section 16 would be extinguished, and the mineral rights transferred to the United States along with the surface rights. The Rocky Flats Alluvium on the site would remain unextracted. Some reclamation would likely be necessary because of early and mid-twentieth century clay mining on the site, but the effort required to restore those parts of section 16 to tallgrass and mixed grass prairie would be far less than that required to reclaim the site from the full-scale gravel extraction would be likely to take place under Alternative A. Soil and mineral effects on the transportation corridor would be the same as under Alternative A. One of the existing land exchange proposals (Appendix F) would also provide for an extinguishment of mineral leases on lands within the administrative boundary of the Refuge that are currently administered by the DOE, which would allow the subsurface minerals and surface soils on an approximately 629 additional acres to remain in an undisturbed state and allow them to subsequently become a part of the Refuge.

There would be little difference in direct impacts to water resources between Alternatives A and B because under Alternative B the water rights in section 16 would remain in private ownership. Effects to water quality resulting from potential transportation improvements would be similar to Alternative A, and these development activities would be performed in accordance with applicable local, state, and Federal regulations, including state radiation health standards.

Alternative B would allow section 16 to be protected from development. This would preserve a habitat corridor that may allow future colonization of the Refuge by both new species and other ecotypes of existing species, which may be better suited for future climate regimes. This would allow the Refuge to be managed for greater resilience to climate change.

### **Alternative C**

The effects on section 16 and the transportation corridor would be similar to that described in Alternative A. However, there would be conservation of productive soils on other privately held lands within either Arapaho or Baca National Wildlife Refuges.

### **Alternative D**

Under this alternative, the acquisition of property within Arapaho and Baca National Wildlife Refuges would protect the geological resources of that parcel as under Alternative C, and the Service could potentially pursue the acquisition of an interest in section 16 in the future in order to realize some of the benefits of Alternative B.

## 4.2 Effects on the Biological Environment

This section describes the effects of each alternative on vegetation, wildlife, and Special Status Species. The Service will complete an intra-Service Section 7 consultation on its proposed activities as they relate to the Preble's meadow jumping mouse and the potential for modification of designated critical habitat. This decision is completed as a part of the final environmental assessment.

### Alternative A (No Action)

The No Action Alternative addresses the disposal of the 300-foot-wide transportation corridor along the eastern border of the Refuge, as mandated by the Rocky Flats Act. Therefore, there are few differences in the effect on vegetation or wildlife in the transportation corridor between Alternative A and the other action alternatives.

#### *Vegetation*

As previously mentioned, the 300-foot-wide transportation corridor includes 5,133 feet of streams and ditches (USFWS 2004a), the latter of which are mostly dry. Disturbance to the full 300-foot-strip could destroy more than 9 acres of xeric tallgrass prairie and 65 acres of mesic, riparian, and wetland vegetation. The amount of loss would depend upon the amount and location of disturbance, but could be up to 300 feet for a highway. Besides the potential loss of wildlife habitat associated with the streams if the corridor is developed, there also is the potential for increased downstream sedimentation and turbidity of surface water as a result of runoff from disturbed soil and subsequent erosion. This soil disturbance and resultant erosion could affect aquatic vegetation, at least until the affected areas were stabilized. There also is potential for effects on aquatic resources due to runoff from the impervious surface of a new highway. However, the Rocky Flats NWR CCP/EIS (USFWS 2004a) determined that these effects would not significantly affect the management of Rocky Flats as a wildlife refuge.

If there is no change to the administrative boundary of the Refuge and the 300-foot-wide transportation corridor is divested via direct sale, the existing mineral lease on section 16 may be exploited to extract marketable resources from the Rocky Flats Alluvium on that parcel. If that were to happen, vegetation would be lost in upland areas and in wetland and riparian corridors. Loss of uplands would be particularly problematic for the native xeric tallgrass prairie. The Northwest Corridor Transportation Environmental Study (FHWA 2008) identified much of this section as tallgrass prairie, and Artmann and Hannan (2011, unpublished data) estimated that two-thirds of section 16 was dominated by xeric tallgrass prairie. If the site were disturbed, there is no guarantee that it would be adequately restored. In addition, noxious weeds such as toadflax and several knapweed species would likely proliferate and provide a constant source of weed seed to the adjacent Refuge.

Similar destruction of uplands, wetlands, and riparian areas in the DOE-retained land to the northwest of the Refuge will occur if the No Action Alternative is chosen and the mineral leases are not purchased by the Federal Government. If these northwestern areas are quarried, the mining company will be required to revegetate the sites, but the native vegetation would be lost, including the xeric tallgrass prairie and much of the wetland, riparian, and even upland shrub communities. Even restoration by the mining company would likely fall considerably short of the vegetative communities that currently exist there. Prior to restoration, noxious weeds might proliferate and spread seed over the adjacent Refuge.

## ***General Wildlife and Special Status Species***

The Service works mostly with Federal trust species. Of particular relevance to this EA are special status species (usually threatened and endangered species and other species of concern) and migratory birds. Special status species for this discussion include the Preble's meadow jumping mouse, the bald eagle, the burrowing owl and due to its relevance to important raptor species, the black-tailed prairie dog. In addition, the Refuge Purposes of the Rocky Flats Act included "providing habitat for, and population management of, ... resident wildlife" as well as threatened and endangered and migratory species; therefore some large mammals under State jurisdiction are discussed.

Divestiture and the resulting disturbance to the 300-foot-wide transportation corridor will not likely have a significant effect on wildlife. Most of Rocky Flats NWR has been identified as habitat for ungulates (elk and deer), some of which would be lost by development of the corridor. Also, movements of elk and deer between the Refuge and the open space east of Indiana Street would be hampered, and the impact of this development would likely increase proportionally with increased development of the transportation corridor unless appropriate mitigation measures such as adequate underpasses were included in the transportation plan. However, the Rocky Flats NWR CCP/EIS (USFWS 2004a, p. 193) stated that "the Service does not want to encourage the movement of deer and elk between the Refuge and the open space lands to the east because of the potential for impacts to nearby subdivisions, and efforts to discourage the establishment of a resident elk herd in the grasslands around Rocky Flats. For these reasons the designs of any transportation improvements along the Indiana Street corridor could include crossings that facilitate the movement of smaller species (such as small mammals and reptiles) while prohibiting the movement of deer and elk. Crossings should be located at Woman Creek and Walnut Creek, as well as select upland locations."

The Rocky Flats NWR CCP/EIS (USFWS 2004a) estimated that loss of the entire 300-foot transportation corridor would remove 8.5 acres of Preble's meadow jumping mouse habitat in the transportation corridor portions of Walnut Creek, Woman Creek, and Mower Ditch. After the EIS published, the FWS has designated critical habitat for the Preble's meadow jumping mouse in a portion of the 300-foot transportation corridor, totaling 12.4 acres. However, a visit by Service biologists to these sites on April 27, 2011, revealed that Preble's meadow jumping mouse habitat was almost nonexistent in Mower Ditch and that Walnut Creek and Woman Creek did not appear as optimal as habitat located west of these two parcels and just east of Indiana Street in the Walnut Creek drainage. The Northwest Corridor Transportation Environmental Study (FHWA 2008) suggested that construction of a highway could cause harm to the species from increased mortality of individual mice during construction, but would be designed to facilitate Preble's movement through better culverts at Walnut Creek and Woman Creek. Compliance with the ESA will need to occur should construction of the highway go forward, which would may adversely affect the Preble's meadow jumping mouse.

The black-tailed prairie dog is a Colorado Species of State Concern (FHWA 2008). Although about three-quarters of the transportation corridor area is potential habitat for the prairie dog, less than 2 acres were occupied in 2004 (USFWS 2004a). A recent outbreak of sylvatic plague may have eliminated all of these occupants. Considering the large expanse of unoccupied prairie dog habitat within the Refuge, divestiture of the transportation corridor is not considered potentially problematic for this species, or for other special status species such as burrowing owls and bald eagles that prey upon the prairie dog. While the eagle is no longer protected as a threatened or endangered species, it holds its "special" status through specific

legal mandates under the Bald and Golden Eagle Protection Act of 1940. However, the obvious proximity of the transportation corridor to a currently busy road (Indiana Street) and the lack of suitable bodies of water along this corridor diminish the suitability of this area for bald eagles. Better eagle habitat is available in nearby open spaces and reservoirs.

The burrowing owl is listed as threatened by the State of Colorado (CDOW 2011), and is dependent on prairie dog towns for nesting. However, very little prairie dog activity has been observed in the transportation corridor in recent years. With large areas available for prairie dogs elsewhere, burrowing owls should not be adversely affected by any transportation use in the 300-foot-wide corridor.

Similarly, other migratory bird species such as raptors, neotropical migrants, waterfowl, and shorebirds are not likely to be adversely affected by the divestiture. While some grassland and riparian habitats do exist in and near the corridor (USFWS 2004a), the amount of suitable habitat that would be lost is not considered significant enough to adversely affect any species in these groups. Ferruginous hawks rely on prairie dogs for prey, but the transportation corridor does not hold enough prairie dogs (if any) to be essential to these raptors.

Additional noise and light would result from the construction and use of the transportation corridor. This is particularly problematic for birds (USFWS 2004a). These disturbances would be greater on a larger project such as a four-lane highway than a smaller improvements such as a bike path. The Rocky Flats NWR CCP/EIS identified several methods of mitigating these disturbances for both construction (e.g., light positioning) and traffic (e.g., vegetation sound barriers).

Under the No Action Alternative, section 16 would remain available for future development, which would isolate the Refuge from existing regional open space that runs along much of the Front Range. This property is important for current and future movements of wildlife, especially deer and elk, between the foothills and the Refuge. From the standpoint of Federal trust species, section 16 contains some riparian habitat that is considered suitable for Preble's meadow jumping mouse and also possesses excellent shrubby riparian corridors that are potentially important to neotropical migrant bird species. In addition, open native prairie such as found in section 16 is important to various species of grassland birds, and some open water is used by waterfowl and wading birds. Currently, much of this habitat is far enough away from SH 93 to be very useful to these species, all of which could potentially be lost under the No Action Alternative. Also, section 16 provides a mile of buffer to the Refuge, which could be replaced by a mining operation or other development considered inappropriate along the perimeter of a wildlife refuge.

Under the No Action Alternative, there would be no possibility of obtaining the mineral leases and eventually the mineral rights to the land located northwest of and adjacent to the Refuge. Parts of this property are currently very important to Preble's meadow jumping mouse. Both the riparian areas and the upland shrublands are also significant to many species of birds and mammals. Deer and elk are seen in and near these parcels on a regular basis. Some native xeric tallgrass prairie exists in this area and is used by migratory songbirds. All of this could potentially be lost under the No Action Alternative.



## **Alternative B (Proposed Action)**

Alternative B would expand the administrative boundary of the Refuge and complete a land exchange for holdings at the Refuge. As with all alternatives, land up to 300 feet wide along the eastern border of the Refuge would be divested, as mandated by the Rocky Flats Act. However, the transportation corridor would be exchanged for land and related mineral leases and rights for most of section 16 along the southwestern border and for mineral leases on DOE-retained lands northwest of the current Refuge border.

### ***Vegetation***

Impacts to vegetation along the 300-foot-wide transportation corridor in Alternative B would be similar to those in Alternative A.

If Alternative B is selected, the existing mineral lease on section 16 will not be exploited for marketable resources in that parcel. If the Service acquires the lease, vegetation would be preserved and could likely be improved through an Integrated Pest Management (IPM) approach to weed control in upland grassland areas and in wetland and riparian corridors. Protection of uplands would be particularly important for the native xeric tallgrass prairie, which is widespread in this section (FHWA 2008). Noxious weeds such as toadflax and knapweed species would likely disappear over time and quit ‘infecting’ adjacent Refuge land with a constant source of weed seed.

Similar destruction of uplands, wetlands, and riparian areas in the DOE-retained land northwest of the Refuge could be averted if Alternative B is selected and the mineral leases are purchased by the Federal Government. The xeric tallgrass prairie, the wetland and riparian vegetation and several upland shrub communities would be permanently protected. Future weed infestations would be less likely than under the No Action Alternative, and weed encroachments could be controlled more easily.

Preserving the xeric tallgrass community is not to be taken lightly. Essington et al. (1996) and Nelson (2003) have proposed that this type of grassland is probably a small relict of a community that was once connected to the tallgrass prairie hundreds of miles to the east. The CNHP considers this community to be so rare that it exists in fewer than 20 places globally, and that Rocky Flats has the largest example remaining in Colorado and perhaps North America (Essington et al. 1996). The CNHP ranks the xeric tallgrass community as imperiled within the State. A significant portion of this prairie is located in section 16 and the two DOE parcels northwest and adjacent to the Refuge.

### ***General Wildlife and Special Status Species***

Impacts to wildlife along the 300-foot-wide transportation corridor in Alternative B would be similar to those in Alternative A.

Under Alternative B, section 16 would no longer be available for future development and therefore would provide a wildlife corridor between the current Refuge and existing regional open space that runs along much of the Front Range. This property is especially important to deer and elk moving between the foothills and the Refuge. From the standpoint of Federal trust species, expanding the Refuge to include section 16 would protect some existing riparian habitat that is considered suitable for the Preble’s meadow jumping mouse and is potentially important to neotropical migrant bird species. Open native



prairie, such as that found in section 16, is important to various species of grassland passerines and raptors, and open water at Rocky Flats Reservoir is used by waterfowl and wading birds. These habitats would remain in their current status or improve if protected. Alternative B would continue to provide a mile of buffer to the existing Refuge, which, if the No Action Alternative were selected, could be replaced by a mining operation or other development considered inappropriate along the perimeter of a wildlife refuge.



*Section 16 contains riparian shrubland along Woman Creek, known to be important Preble's mouse habitat*

Under Alternative B, the mineral rights to the land located northwest and adjacent to the Refuge would be back in Federal ownership, protecting these important areas. Preserving the xeric tallgrass prairie would protect habitat for some migratory passerines and raptors. Parts of this property are considered very important to Preble's meadow jumping mouse. Both the riparian areas and the upland shrublands are also significant to many other species of birds and mammals. Deer and elk are seen in and near these parcels on a regular basis. All of this important habitat would be preserved under Alternative B.

### **Alternative C**

Alternative C would not expand the administrative boundary of the Refuge but would complete a land exchange for holdings at other refuges in Colorado. As with all alternatives, a strip of land up to 300 feet wide along the eastern border of the Refuge would be divested, as mandated by the Rocky Flats Act. The transportation corridor would be exchanged for an inholding at either Arapaho NWR or Baca NWR.



## ***Vegetation***

Impacts to vegetation along the 300 foot transportation corridor in Alternative C would be similar to those in Alternative A, though the construction of a bike path or a bike path coupled with improvements to Indiana Street is likely to have a smaller footprint than the construction of a toll highway with a bike path.

If the 300-foot-wide transportation corridor is divested through an exchange with Arapaho NWR or Baca NWR, and therefore there is no change to the administrative boundary of Rocky Flats NWR, the existing mineral lease on section 16 may be exploited to extract marketable resources from the Rocky Flats Alluvium on that parcel. If that were to happen, vegetation would be lost in grassland areas and in wetland and riparian corridors. Loss of uplands would be particularly problematic for the native xeric tallgrass prairie in section 16 because this vegetation type dominates approximately two-thirds of the section (Artmann and Hannan 2011, unpublished data). If disturbed, there is no guarantee that the site would be adequately restored. In addition, noxious weeds such as toadflax and several knapweed species would likely proliferate and provide a constant source of weed seed to the adjacent Refuge.

Similar destruction of uplands, wetlands, and riparian areas in the DOE-retained land northwest of the Refuge would likely occur if Alternative C is selected and the mineral leases are not purchased by the Federal Government. If these northwestern areas are quarried, the mining company will be required to revegetate the sites, but this would eventually destroy the native vegetation, including the xeric tallgrass prairie and much of the wetland and riparian and even upland shrub communities. Even restoration by the mining company would likely fail to replace the vegetative communities that currently exist there. Prior to restoration, noxious weeds might proliferate and spread seed over the adjacent Refuge.

If Alternative C is selected and the inholding in the southern portion of Arapaho NWR is exchanged for the 300-foot transportation corridor, a large parcel of riparian and upland habitats would become part of the Arapaho Refuge. The riparian, meadow and wetland areas along the Illinois River (a stream at this location) produce six species of willows and numerous species of grasses, sedges, and rushes (USFWS 2004b). The upland areas also have numerous grasses and a number of shrub species. Common weedy species include Canada thistle and some grasses that have been introduced for grazing and haying. Selection of Alternative C / Arapaho would preserve this unique area and provide an opportunity to control the exotic species there.

If Alternative C is selected and The Nature Conservancy (TNC) inholding in the southern portion of Baca NWR was exchanged for the 300-foot right-wide strip, a large parcel of mostly shrubland/grassland mix and herbaceous stabilized areas in sandy soils, with some mesic meadows, playas, and emergent marshes (USFWS 2005b) would be protected. Typical upland species appear to be rubber rabbitbrush (*Chrysothamnus nauseosus*), greasewood (*Sarcobatus vermiculatus*), and numerous native and non-native species of grasses. Weedy species include cheatgrass (*Bromus tectorum*, a highly invasive exotic), and crested wheatgrass (*Agropyron cristatum*, a commonly planted species for grazing, haying, and soil stabilization). Selection of Alternative C / Baca NWR would preserve this site and provide an opportunity to control the existing exotic species.

## ***Wildlife and Special Status Species***

Impacts to wildlife along the 300-foot-wide transportation corridor in Alternative C would be similar to those in Alternative A, though as stated above, the footprint of a proposed transportation improvements currently fitting Alternative C would be smaller and effects on wildlife would be lower.

Under Alternative C, section 16 would remain available for future development, which would isolate the Rocky Flats NWR from existing regional open space that runs along much of the Front Range. This property is important for current and future movements of wildlife, especially deer and elk, between the foothills and the Refuge. From the standpoint of Federal trust species, section 16 contains some riparian habitat that is considered suitable for Preble's meadow jumping mouse, and also possesses excellent shrubby riparian corridors that are potentially important to neotropical migrant bird species. In addition, open native prairie such as that found in section 16 is important to various species of grassland birds, and open water at Rocky Flats Reservoir is used by waterfowl and shorebirds. Currently, much of this habitat is far enough away from SH 93 to be very valuable to these species, all of which could potentially be lost under the No Action Alternative. Also, section 16 provides a mile of buffer to the Refuge, which could be replaced by a mining operation or other development considered inappropriate along the perimeter of a wildlife refuge.

Under Alternative C, there would be no possibility of obtaining the mineral leases and eventually the mineral rights to the land located northwest and adjacent to the Refuge. Parts of this property are currently very important to Preble's meadow jumping mouse. Both the riparian areas and the upland shrublands are also significant for many species of birds and mammals. Deer and elk are seen in and near these parcels on a regular basis. Some native xeric tallgrass prairie exists in this area and is used by migratory songbirds. All of this could potentially be lost under Alternative C.

If Alternative C is selected and the inholding in the southern portion of Arapaho NWR is exchanged for the 300 foot corridor, a large parcel of riparian (with some meadow and wetland areas) and upland habitats would become part of that Refuge. Wildlife using these habitats at Arapaho NWR include sage grouse (*Centrocercus urophasianus*), various raptors, numerous species of waterfowl and shorebirds, and at least 40 species of migrating songbirds (USFWS 2004b). Mammals that use the area include beaver (*Castor canadensis*) and several species of large mammals such as moose (*Alces alces*), pronghorn (*Antilocapra americana*), mule deer, and elk. Selection of Alternative C would provide management opportunities for a variety of wildlife species under Federal and state jurisdiction, such as sage grouse and big game species.

If Alternative C is selected and TNC inholding in the southern portion of Baca NWR was exchanged for the 300-foot corridor, a large parcel of mostly shrublands and grasslands that provide wildlife habitat for a number of avian species, including songbirds such as horned larks (*Eremophila alpestris*) would be protected. The wetter areas within the surrounding area provide habitat for numerous other birds including various waterfowl, American avocets (*Recurvirostra americana*), and sandhill cranes (*Grus canadensis*). Globally vulnerable small mammals that live in these environments and which might be protected under Alternative C include the silky pocket mouse (*Perognathus flavus sanluisi*) and the thirteen-lined ground squirrel (*Spermophilus tridecemlineatus blanca*) (USFWS 2005b).

## **Alternative D**

Alternative D would not only exchange land to expand the administrative boundary of Rocky Flats NWR, but also to obtain holdings at another refuge. As with all alternatives, land up to 300 feet wide along the eastern border of the Refuge would be divested, as mandated by the Rocky Flats Act. However, the transportation corridor would be exchanged for up to three other properties: (1) most of section 16, (2) the mineral leases/rights on DOE properties northwest of the Refuge, and (3) an inholding at either Arapaho NWR or Baca NWR. These exchanges would likely be on different timelines. Timing and expense are factors that would dictate the potential to pursue Alternative D.

### ***Vegetation***

Impacts to vegetation along the 300-foot-wide transportation corridor in Alternative D would be identical to those in Alternative A and therefore will not be discussed further.

If Alternative D is selected, the existing mineral lease on section 16 will not be exploited for marketable resources in that parcel. If the Service acquires the lease, vegetation would be preserved and probably improved through an IPM approach to weed control in upland grassland areas and in wetland and riparian corridors. Protection of uplands would be particularly important for the native xeric tallgrass prairie, which is widespread in this section (FHWA 2008). Noxious weeds such as toadflax and knapweed species would likely disappear over time and quit infesting adjacent Refuge land with a constant source of weed seed.

Similar destruction of uplands, wetlands, and riparian areas in the DOE-retained land northwest of the Refuge could be averted if Alternative D is selected and the mineral leases are purchased by the Federal Government. The xeric tallgrass prairie, the wetland and riparian vegetation, and several upland shrub communities would be permanently protected. Future weed infestations would be less likely than under Alternatives A or C, and weed encroachments could be controlled more easily.

Preserving the xeric tallgrass community is an important priority of the Service and other agencies. Essington et al. (1996) and Nelson (2003) have proposed that this type of grassland is probably a small relict of a community that was once connected to the tallgrass prairie hundreds of miles to the east. The CNHP reports that this community is now so rare that it exists in fewer than 20 places globally, and that Rocky Flats NWR has the largest example remaining in Colorado and perhaps North America (Essington et al. 1996). The CNHP ranks the xeric tallgrass community as imperiled within the State. A significant portion of this prairie is located in section 16 and the two DOE parcels northwest and adjacent to the Refuge.

If Alternative D is selected and the inholding in the southern portion of Arapaho NWR was part of the exchange for the 300-foot-wide transportation corridor, a large parcel of riparian and upland habitats would become part of the that Refuge. The riparian, meadow and wetland areas along the Illinois River (a stream at this location) produce six species of willows and numerous species of grasses, sedges, and rushes (USFWS 2004b). The upland areas also have numerous grasses, but also a number of shrub species. Common weedy species include Canada thistle and some grasses that have been introduced for grazing and haying. Selection of Alternative D would preserve this unique area and provide an opportunity to control the exotic species there.

If Alternative D would be selected and TNC inholding in the southern portion of Baca NWR were part of the exchange for the 300-foot-wide transportation corridor, a large parcel of mostly shrubland/grassland mix and herbaceous stabilized areas in sandy soils, with some mesic meadows, playas, and emergent marshes would be protected (USFWS 2005b). Typical upland species appear to be rubber rabbitbrush, greasewood, and numerous native and non-native species of grasses. Weedy species include cheatgrass (a highly invasive exotic) and crested wheatgrass (a commonly planted species for grazing, haying, and soil stabilization). Selection of Alternative D would preserve this site and provide an opportunity to control the existing exotic species.

### ***General Wildlife and Special Status Species***

Impacts to wildlife along the 300-foot transportation corridor in Alternative D would be identical to those in Alternative C and therefore will not be discussed further.

Under Alternative D, section 16 would no longer be vulnerable to future development and therefore would provide a wildlife corridor from the current Refuge to existing regional open space that runs along much of the Front Range. This property is especially important to deer and elk moving between the foothills and the Refuge. From the standpoint of Federal trust species, expanding the Refuge to include section 16 would protect some existing riparian habitat that is considered suitable for the Preble's meadow jumping mouse and is important to neotropical migrant bird species. Its open native prairie areas are important to various species of grassland passerines and some raptors, and open water at Rocky Flats Reservoir is used by waterfowl and wading birds, the current status of all of which would remain steady or actually improve. Alternative D would continue to provide a mile of buffer to the existing Refuge, which otherwise could be replaced by a mining operation or other development considered inappropriate along the perimeter of a wildlife refuge.

Under Alternative D, the mineral rights to the land located northwest and adjacent to the Refuge would be back in Federal ownership and these important areas would be protected from mining or other disturbance. Protecting the xeric tallgrass prairie would protect habitat for some migratory songbirds and raptors. Parts of this property are considered very important to Preble's meadow jumping mouse. Both the riparian areas and the upland shrublands are also significant to many other species of birds and mammals. Deer and elk are seen in and near these parcels on a regular basis. All of this important habitat would be preserved under Alternative D.

If Alternative D is selected and the inholding in the southern portion of Arapaho NWR were part of the exchange for the 300-foot-wide transportation corridor, a large parcel of riparian habitat (with some meadow and wetland areas) and upland habitats would become part of that Refuge. Wildlife using these habitats at Arapaho NWR include sage grouse, raptors, numerous species of waterfowl and shorebirds, and at least 40 species of migrating songbirds (USFWS 2004b). Mammals that use the area include beaver and several species of charismatic megafauna including moose, pronghorn, mule deer, and elk. Selection of Alternative D NWR would provide management opportunities for a variety of wildlife species under Federal (e.g., sage grouse) and State (e.g., big game) jurisdiction.

If Alternative D were selected and the TNC inholding in the southern portion of Baca NWR was part of the exchange for the 300-foot-wide transportation corridor, a large parcel of mostly shrublands and grasslands with some wetter areas would provide wildlife habitat for a number of avian species, including songbirds such as horned larks. The wetter areas within the general area provide habitat for numerous

other birds including various waterfowl, American avocets, and sandhill cranes. Globally vulnerable small mammals that live in these environments and that would be protected under Alternative D include the silky pocket mouse and the thirteen-lined ground squirrel (USFWS 2005b).

### **4.3 Effects on Cultural Resources**

This section describes the estimated effects of each alternative on cultural resources.

#### **Alternative A (No Action)**

There could be the disturbance or loss of some of the linear ditches, which are non NRHP-eligible cultural resources within the 300 foot wide transportation corridor. These non-eligible sites are described in section 3.3; Previous Cultural Resource Investigations in Proposed Divestiture Lands. The SHPO concurred with the finding of no adverse effect for the proposed land disposal on November 5, 2010. Therefore, this alternative is not anticipated to result in an adverse effect.

#### **Alternative B (Proposed Action)**

The same effects as Alternative A are anticipated from the selection of Alternative B. Although, no cultural resources were located through previous studies in section 16, there is a potential that unidentified cultural resources may be protected by the addition of section 16 to the Refuge.

#### **Alternative C**

The same effects as Alternative A are anticipated from the selection of Alternative C. In addition, potentially unidentified cultural resources on private inholdings within Arapaho NWR or Baca NWR may be protected.

#### **Alternative D**

The same effects as Alternative C are anticipated from the selection of Alternative D. Although, no cultural resources were located through previous studies in section 16, there is the potential that unidentified cultural resources may be protected by the addition of section 16 and through future acquisitions of lands at other refuges.

### **4.4 Effects on the Socioeconomic Environment**

This section describes the estimated effects of alternatives A, B, C, and D on the socioeconomic environment; specifically on land ownership, land use and development (including oil and gas, wind energy, and residential), and public use.

#### **Effects on Land Ownership, Use and Development**

The effects of the various alternatives on land ownership and land use are described below. The primary differentiator between the alternatives involves the potential for acquisition of State-controlled property within section 16, which has the potential to expand preserved open space holdings in the Rocky Flats NWR.

### ***Alternative A (No Action)***

As with all the alternatives, a 300-foot-wide strip of land would be disposed of by the Service, reducing the amount of Refuge land by approximately 100 acres. No other property outside of or within the Refuge would be affected. Under this alternative, the land removed from the Refuge would not be replaced or exchanged with an equal amount of new property, resulting in a net reduction in Federal open space.

### ***Alternative B (Proposed Action)***

The disposition of the land for a transportation improvement project would be used as a mechanism for a land exchange for new holdings at the Refuge, specifically within a 617-acre area at the far southwest edge of the existing acquisition boundary. Expansion of the acquisition boundary would allow for the Service to acquire land in this area, and the actual turning over of some portion of land to the Service would occur as a result of an exchange of land with approximately an equal value to the 300-foot-wide boundary area.

The proposed action would allow for the transfer of existing State-owned property to the Federal Government, and would potentially lead to contiguous connection with protected open space lands to the west. No private land owners would be affected by the expansion of the acquisition boundary, or the change from State lands to Federal ownership. Any ongoing lessees of these properties, such as for mining or livestock grazing, may be affected by this action. The acquisition of land within this area will reduce the likelihood that future development pressures, such as from the surrounding communities, will impinge on the preservation of wildlife and protected open space at the Rocky Flats NWR.

### ***Alternative C***

The disposition of the land for a transportation improvement would be used as a mechanism for a land exchange for new holdings at another refuge within Colorado, specifically capitalizing on opportunities to add to land holdings at Arapaho NWR or Baca NWR. This would occur as a result of an exchange of land with approximately an equal value to the 300-foot-wide boundary area, and possibly through the leveraging of opportunities to accept land donations from various charitable trusts.

Other than the disposition of the 300-foot-wide boundary area, this alternative would not have an effect on the land ownership or land use within the Rocky Flats NWR. The result would be a net reduction in land holdings within the Refuge, but may result in a statewide increase in Service-controlled property.

The State-owned land within section 16 would not become Federally-protected open space, and may be open to future activities such as mining, energy development, or residential or commercial development. This could lead to potential economic benefits to the State and local area, as these types of development could have fiscal impacts (sales tax, property tax) or economic growth impacts (jobs, energy development).

### ***Alternative D***

The disposition of the land for a transportation improvement project would be used as a mechanism for a land exchange for new holdings at another refuge within Colorado as defined in Alternative C. While the



acquisition boundary for the Refuge would be expanded to include section 16, no immediate exchange for land within this area would take place.

Expansion of the acquisition boundary would allow for the Service to acquire land in the State-owned section 16 area, although it would not require that the property is preserved in accordance with Refuge guidance. The land in this area would still be open to future activities such as mining, energy development, or residential or commercial development. This could lead to potential economic benefits to the State and local area, as these types of development could have fiscal impacts (sales tax, property tax) or economic growth impacts (jobs, energy development).

Overall, the size of the Rocky Flats NWR would be reduced in the short term, even though there may be a statewide increase in Service-controlled property due to acquisitions at Arapaho NWR or Baca NWR.

## **Effects on Public Use**

Because the Rocky Flats NWR is currently not open for public use, there are not any existing public users that would be negatively affected by the various alternatives. However, the impacts to long-term plans for various public uses on the site are considered.

For all of the alternatives, the creation of a transportation improvement within the 300-foot-wide boundary area has the potential to serve as a barrier between the Rocky Flats NWR and the community and open space assets to the east. A stipulation of the disposition of the land for this improvement is that it must be undertaken so as to minimize potential negative impacts to the management and access to the Refuge.

### ***Alternative A (No Action)***

Because there would be no additional Refuge property added as part of this alternative, there would be no additional impact to public use options at the Rocky Flats NWR. At the same time, there would not be an opportunity to expand the options for public use through the exchange of land for additional Refuge property. The visitor experience in future public use scenarios would be adversely affected by proposed transportation improvements that may follow this action.

### ***Alternative B (Proposed Action)***

Under this alternative, the Rocky Flats NWR property would be expanded to incorporate additional land within the section 16 area. This would create additional opportunities for public recreation and use, and greater contiguity between existing open space assets controlled by the various Federal, State, county, and municipal governments in the immediate area. Additional effects would be similar to Alternative A.

### ***Alternative C***

Because there would be no additional Refuge property added as part of this alternative, there would be no additional impact to public use options at the Rocky Flats NWR. At the same time, there would not be an opportunity to expand the options for public use through the exchange of land for additional Refuge property. However, public use options at the existing Arapaho NWR and Baca NWR may be expanded under this alternative. Additional effects would be similar to Alternative A, though the potential

construction of a bike path, or a bike path with improvements to Indiana Street, is likely to have lesser adverse effects on the visitor experience at Rocky Flats NWR.

### ***Alternative D***

Because there would be no additional Refuge property added as part of this alternative, there would be no additional impact to public use options at the Rocky Flats NWR. Over the long-term, expansion of the acquisition boundary may lead to incorporation of land within the State-owned section 16 area. However, public use options at the existing Arapaho NWR and Baca NWR may be expanded under this alternative. Additional effects would be similar to Alternative A, though the potential construction of a bike path, or a bike path with improvements to Indiana Street, is likely to have lesser adverse effects on the visitor experience at Rocky Flats NWR.

## **Effects on Environmental Justice**

Environmental Justice is defined as the fair treatment of people of all races, culture, incomes, and educational levels with respect to the development and enforcement of environmental laws, regulations, and policies. Fair treatment means that no population should be forced to shoulder a disproportionate share of environmental consequences resulting from industrial, municipal, and commercial operations or the execution of Federal, State, local, and tribal programs and policies. Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, mandates Federal agencies make achieving environmental justice part of their mission.

Because there are no people living at the Rocky Flats NWR, there are no residents who would be negatively nor disproportionately impacted by the various alternatives considered in this EA. The racial composition of the surrounding areas is predominantly white and not of Hispanic heritage. Median household income characteristics describe a population that has higher household income than State and national figures. These statistics are similar at Arapaho and Baca NWR. Based on the race and income characteristics of the surrounding communities and counties in these areas, as described in Section 3.4, there are not anticipated to be any disproportionate environmental justice impacts to sensitive or protected populations.

## **4.5 Unavoidable Adverse Impacts**

Any adverse effects that may be unavoidable when carrying out these alternatives are described below.

Under all alternatives, land within 300 feet of Indiana Street will be transferred to an entity which has proposed transportation improvements in that corridor. All alternatives would result a loss of the habitat within the 300-foot-wide transportation corridor. This includes loss of critical habitat for the Preble's meadow jumping mouse. Details of the area and type of habitat lost are discussed in more detail in the 2004 Rocky Flats CCP/EIS (USFWS 2004a) and in this EA.

Increased noise associated with the proposed transportation improvements along Indiana Street could adversely impact the experience of Refuge visitors and displace wildlife or affect their behavior. Many species depend on sound to communicate, avoid danger, and locate food. Studies have found that noise can impact reproduction, productivity, behavior, and energy expenditure in wildlife (Bowles 1995). Increased traffic volume and/or speeds may impact wildlife species sensitive to noise. Lighting equipment

and increased light along the roadway could adversely affect some wildlife species. Artificial light can disrupt bird behavior, affect migration, increase bird collisions with structures, and increase risk of predation (IDA 2002). Impacts to the Refuge could be reduced by incorporating berms, sound walls, vegetation, or other noise-reducing techniques into the design of transportation improvements to reduce the impacts of traffic noise on wildlife and Refuge visitors. Roadway lighting could be designed to reduce light emission and be positioned to minimize effects to wildlife and Refuge aesthetics.

Use of standard emission minimization measures and dust abatement would mitigate potential impacts to air quality during construction for any of the proposed alternatives (FHWA 2008). Therefore, the Service does not anticipate significant impacts to air quality through violation of National Ambient Air Quality Standards<sup>10</sup> based on the proposed action. However, foreseeable transportation improvements which may lead to increased vehicle traffic are likely to result in higher vehicle emissions near the Refuge. This could result in negative effects to air quality, particularly in the form of higher ozone, volatile organic compound (VOC), and carbon monoxide (CO) levels. The Denver metropolitan area has a history of nonattainment of EPA standards for ozone and CO (FHWA 2008), though Denver is presently in a maintenance status. Because the implementation of proposed transportation alternatives is speculative, it is difficult to quantitatively analyze potential impacts of these proposals on air quality. However, a detailed analysis of Northwest Corridor Transportation Environmental Study construction alternatives determined that none of the alternatives would be likely to violate air quality standards or maintenance plans (FHWA 2008).

In addition, construction work to carry out the planned transportation improvements could disturb plutonium and other radioisotope contaminants potentially present in the surface soils of the 300-foot-wide parcel. The Service requested clarification on risks associated with construction activities on the transportation corridor. The CDPHE and EPA have provided specific analysis of this activity and determined the risk to a construction worker is at or below the low end of the CERCLA risk range (1 x 10<sup>-6</sup>) and any potential impacts to neighboring communities do not present health or environmental concerns (CDPHE 2011, Appendix G). An entity wishing to develop that parcel for transportation improvements would likely be required to take measures such as dust abatement to remain in compliance with Colorado Standards for Protection Against Radiation regulations<sup>11</sup>. Further, both the construction process and potential increased vehicle use on the Refuge boundary would result in an increased risk of the discharge of oil or the release of hazardous substances onto the Refuge or adjacent lands and waters.

## **4.6 Irreversible and Irretrievable Commitments of Resources**

Any commitments of resources that may be irreversible or irretrievable because of carrying out alternatives A, B, C, or D are described below.

### **Alternative A (No Action)**

There would be no commitment of resources by the Service if the No Action Alternative were selected. The Service's obligation under the Rocky Flats Act would be discharged.

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<sup>10</sup> 40 CFR §50 – National Primary and Secondary Ambient Air quality Standards

<sup>11</sup> 6 CCR 1007-1 Part 4 – Standards for Protection Against Radiation; effective July 31, 2005

## **Alternative B (Proposed Action)**

The Service would commit \$2.8 million of property in the 300 foot transportation corridor toward a land exchange. The exchange and subsequent donation of land and surface mineral rights would result in the receipt of approximately \$15 million in property and unexploited mineral estates by the United States.

## **Alternative C**

The Service would commit \$2.8 million of property in the 300 foot transportation corridor toward an exchange for an equivalent value of privately-held inholdings within Baca NWR or Arapaho NWR.

## **Alternative D**

The same effects as Alternative C are anticipated under Alternative D. There would be no irreversible or irretrievable commitment of resources involved in the expansion of the administrative boundary of Rocky Flats NWR to include section 16. Potential acquisition of property in that section could come through LWCF funding or other appropriate means.

## **4.7 Cumulative Impacts**

As defined by the Council on Environmental Quality's regulations for implementing NEPA (40 CFR §1508.7), a cumulative impact is the impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

This section describes the past, present, and reasonably foreseeable future actions related to the proposed action and alternatives. To define projects included for the cumulative analysis, only those actions were considered that have a reasonable expectation that they may occur, and would result in an identifiable incremental impact when combined with the effects of the proposed action or alternatives.

### **Past Actions**

The most important past action that has the potential for cumulative impacts was the operation of the Rocky Flats Plant, which had a primary mission of manufacturing triggers for nuclear weapons. Construction of the plant, which was operated by DOE, began in 1951 and the plant was permanently decommissioned in 1992. Due to the nature of the work at the plant, radioactive materials, including plutonium and uranium, were onsite, and through a variety of means, resulted in contamination of soils and groundwater at the site. Additional contamination resulted from airborne plutonium. Several studies were conducted by the EPA and other organizations that mapped detectable levels of radioactive elements on the Rocky Flats property and at offsite areas, primarily east/southeast of the former plant in the direction of the prevailing winds.

The Rocky Flats Plant was placed on the EPA National Priority List (NPL) and became an EPA superfund site, with cleanup starting in 1992. In 2007, the EPA announced that a large portion of the Rocky Flats site was deleted from the NPL which reflected the completion of the response actions needed

to clean up the site. This allowed the DOE to transfer part of the Rocky Flats site to the U.S. Department of Interior (DOI) for the Service to manage as a National Wildlife Refuge. Section 1.1 in chapter 1 gives a brief description of the transfer of the Rocky Flats site to the Service.

## **Present Actions**

The 2005 Rocky Flats NWR CCP sets the management direction for the Refuge. The CCP emphasizes conservation of habitat and wildlife, along with a moderate level of wildlife dependent public uses, primarily trails and interpretive displays. Due to a lack of funding, implementation of parts of the CCP is on hold, and most of the public access, as well as proactive habitat and wildlife conservation plans have been delayed. Present management at the Refuge focuses on maintenance, compliance with weed control regulations, and compliance with endangered species requirements.

As described in section 1.2 in chapter 1, the Service's Proposed Action is to expand the acquisition boundary of the Refuge to accommodate a potential land exchange related to a 300-foot-wide easement along Indiana Street, which was mandated in the Rocky Flats Act. The Act stated that land up to 300 feet in width shall be made available by easement or sale for the sole purpose of transportation improvements, provided that the improvements minimize adverse effects on the management of the Refuge, and are part of an approved Denver regional transportation plan.

## **Reasonably Foreseeable Future Actions**

Reasonably foreseeable future actions are actions and activities that are independent of the proposed action, but may result in cumulative impacts when combined with the Proposed Action or alternatives. The future actions should have a reasonable expectation of occurring, and usually are anticipated to occur regardless of which alternative is selected. Transportation improvements, land development, mining, and recreation development in the form of trails are considered cumulative projects for this EA.

### ***Transportation***

As previously discussed, the Rocky Flats Act included a provision that the Service must make a 300-foot-wide strip along Indiana Street available by easement or sale for transportation improvements. Although the exact configuration of a future transportation improvement is not known at this time, it is likely that there will be improvements to facilitate traffic flow and to provide for bike transportation through the 300-foot-wide strip. .

The Jefferson Parkway Public Highway Authority (JPPHA) provided a proposal (referred to as the Jefferson Greenway Proposal) to the Service regarding the direct sale of the 300-foot-wide transportation corridor along Indiana Street as well as an exchange of land (section 16) to expand the Refuge boundary. Through its scoping comments on this project (letter dated July 29, 2011; see Appendix H), JPPHA refined its proposed plan for the divestiture of the transportation corridor. In a direct sale of the transportation corridor from the Service, JPPHA proposes to develop the "Jefferson Parkway" for regional traffic movement. Although not designed to date, the Parkway may consist of multi-modal improvements and is proposed to retain space for a pedestrian and bicycle pathway in the transportation corridor and along the entire Parkway from SH 128 to SH 93.

The City of Golden has also proposed to acquire the land for transportation improvements, either through sale or land exchange. Golden's proposal and supplements (See Appendix E) detail the use of the 300-foot-wide transportation corridor to provide an important north-south connection for bicycle commuters. They would also potentially reserve a portion of that corridor for improvements to Indiana Street.

Impacts associated with possible transportation improvements can be found in the Rocky Flats CCP/EIS (USFWS 2004) and the Northwest Corridor Transportation Study (CDOT 2008).

### ***Land Development***

The Denver metropolitan area has experienced considerable growth in the recent past, and although current economic conditions have slowed the rate of development, urbanization has spread towards Rocky Flats NWR. Existing open space surrounding the Refuge helps protect the ecological values associated with the Refuge, however there is developable land to the south and southeast of the Refuge. Over the years, much of the surrounding area has experienced the conversion of land from traditionally rural uses such as farming and ranching to more suburban and urban uses. In general, residential and commercial development has continued to replace vacant agricultural land in much of the surrounding area. The Denver Regional Council of Governments estimates that in 20 years, an additional two million residents will occupy the Denver metropolitan region. With the increase in population, areas of development have spread and continue to consume agricultural and open space lands. (FHWA 2008).

The Northwest Parkway Transportation Environmental Study (FHWA 2008) identified two areas of potential future development: the Vauxmont development northeast of SH 93 and SH 72, and the Cimarron Park development northwest of SH 72 and Indiana Street. Some development has already occurred at the Cimarron Park project and the Vauxmont project. Much of the undeveloped land in the same general area, although not currently proposed or platted, has been preliminarily identified for future development. While development of the built environment is occurring, jurisdictions are also active in acquiring and preserving open space, parks, and recreation areas (FHWA 2008). There is potential for further development which may be facilitated by transportation improvements (including bike and roadway developments) that have been proposed for the 300-foot corridor, which would be additive with those discussed above.

### ***Mining***

Existing mining operations are located on the western edge of Rocky Flats NWR. These are primarily aggregate and clay mines. Continued operations at these facilities have the potential for continued cumulative impacts to resources at the Refuge. The proposals to donate and/or retire mineral rights beneath existing DOE and State lands represent a minimal reduction of potential aggregate development in the Denver metropolitan area.

### ***Recreation***

There is a substantial amount of designated open space surrounding the Rocky Flats NWR. These areas are managed by numerous local agencies, including Boulder County, Jefferson County, and the cities of Boulder, Westminster, and Broomfield. Future foreseeable development includes trail construction that could connect many of these existing open space areas by connecting trails through the Refuge. Trail



development is part of the 2005 Rocky Flats NWR CCP, but is delayed until such time as funding is available.

As described above, Golden proposes development of the transportation corridor on the east side of the Refuge for an approximately ten-foot-wide bicycle and pedestrian facility, including appurtenant trailhead parking facilities. The proposed bikeway facility is intended for connection to trails, bike lanes, and open space. As discussed above, the JPPHA proposal has also been revised to include a bicycle/pedestrian route along their proposed roadway.

## **Cumulative Impacts by Alternative**

This section describes any adverse cumulative effects that may result from the combination of past, present, and reasonably foreseeable future actions and implementation of the proposed action or alternatives.

### ***Alternative A (No Action)***

Under the No Action Alternative, the Service would not change the administrative boundary of the Refuge, and would engage in a direct sale of the 300-foot-wide transportation corridor as directed by the Rocky Flats Act. Revenue from the direct sale would be deposited into the U.S. Treasury.

Cumulative impacts to the Refuge would include use of the 300-foot-wide strip along Indiana Street as a transportation corridor. For this analysis, it is assumed that the transportation improvement would involve construction of a roadway for use by motorized vehicles.

Construction activities associated with transportation improvements would require clearing and grading of a transportation corridor which would result in soil disturbance. The EPA has certified that no hazardous contamination (including plutonium) occurs above levels that allow for unlimited use of the area. As described in Section 1.5 in Chapter 1, should the Service dispose of the property to an entity for transportation purposes, the project would be subject to the State of Colorado Radiation Control Regulations. The CDPHE has stated that construction activities would require appropriate construction controls such as dust abatement, erosion control, and sediment control (CDPHE 2011; Appendix G). It would be the responsibility of the owner and developer of improvements in the 300-foot-wide corridor to comply the State of Colorado requirements regarding issues of public health and for appropriate implementation of control techniques that may be necessary during construction. The cumulative impacts would include the potential for the release of airborne contamination during construction, although the existing level of contamination is considered low as the EPA certified in 2007 that the planned corrective actions had been completed for all of what is now Rocky Flats NWR.

In addition to soil disturbance and the resulting potential for contamination, several other resources may be impacted by the development of transportation improvements. These potential impacts were discussed in the 2004 Rocky Flats NWR CCP/EIS (USFWS 2004a) and included effects to water resources, noxious weeds, wildlife, vegetation, noise and aesthetics, and public use.

Land development in the area surrounding the Refuge could be facilitated by sale of the transportation corridor and could affect Refuge resources through several means. Clearing land for future development could result in weed infestations that could affect Refuge lands; land development could be a movement

barrier to wildlife between the Refuge and surrounding open space lands; development along the southern boundary of the Refuge could impact Preble's meadow jumping mouse habitat potentially connected to the Refuge and urbanization can bring an increase in domestic pets, especially cats that can have a negative impact on native rodents and birds; development can bring an increase in traffic to roads surrounding the Refuge; construction activities can affect the natural scenery and visual character of the landscape as viewed from the Refuge; and housing or commercial development in proximity to the Refuge can increase the ambient noise levels. Land development and urban growth have put a significant strain on the area's natural resources, most notably water supplies. They are also driving up land values, making it increasingly expensive for local and county governments to preserve additional open space, and for agricultural landowners to stay in business. Many communities have begun to recognize the importance of open space and are taking steps to preserve open space corridors for residents and wildlife alike in their respective community comprehensive plans (FHWA 2008).

Future mining activity, primarily along the western edge of the Refuge, could result in impacts to the Refuge through impacts to soils (erosion and windblown soil deposition), water resources (changes in surface and groundwater flows), vegetation (disturbance to vegetation communities; weed infestation), wildlife (disruption to animal movement; fragmented habitat; noise and human activity), threatened and endangered species (direct or indirect impacts to Preble's meadow jumping mouse habitat), visual resources (ground disturbance impacts to scenic quality), noise (increased noise from mine operations), and air quality (dust and windblown soil).

Recreation development related to the cumulative projects identified for the assessment is primarily related to trails. As mentioned above, Golden has proposed a bike and pedestrian trail within the 300-foot-wide transportation corridor, with associated trailhead parking. The trail could connect to other existing or planned trails and open space. Other local jurisdictions have future plans for trail development that could impact public use at the Refuge. Impacts of constructing a bike/pedestrian trail would include soil disturbance, which could result in the soil contamination issue discussed above, although construction of a trail would have substantially less potential for soil disturbance than construction of a roadway. Other potential cumulative impacts related to Refuge resources would include an increase in public use, recreation, and interpretation activities, which would be in compliance with the 2005 Rocky Flats NWR CCP and considered a beneficial impact. However, generally as human activity increases in the area, negative impacts to wildlife habitat and movement would likely increase.

The above analysis discusses the potential cumulative impacts to resources at Rocky Flats NWR. These impacts could occur regardless of which alternative is implemented. Disclosure of these impacts provides context for the cumulative impacts of the alternatives themselves. Alternative A, other than the direct sale of the 300-foot-wide transportation corridor, would result in no change to existing management or the administrative boundary. As such, this alternative would have little effect as far as adding to cumulative impacts to Refuge resources. The spread of noxious weeds at the Refuge is an ongoing problem; the situation existed at the site in 2007 when the land was transferred to the Service and continues to be an issue. Continued weed infestations would be a cumulative impact to vegetation and wildlife habitat.

### ***Alternative B (Proposed Action)***

Alternative B includes the expansion of the administrative boundary to include section 16 located at the southwest corner of the existing Refuge boundary. The Service would sell the 300-foot-wide transportation corridor in exchange for equal interest in lands within section 16. Additionally, the Service

would continue efforts to acquire subsurface mineral rights within both the existing and expanded administrative boundary. Implementation of this alternative would generally have a positive effect as far as reducing cumulative impacts to Refuge resources. Acquiring section 16, and subsurface mineral rights would benefit wildlife and create a connection between the Refuge and open space areas to the west, protect Preble's meadow jumping mouse habitat, protect a vestige of xeric tallgrass prairie, and would reduce the amount of active mining in the area which would reduce impacts caused by that activity. The effects from the sale of the 300-foot-wide transportation corridor would cause cumulative impacts as previously discussed.

### ***Alternative C***

Alternative C would include the sale of the 300-foot-wide corridor in exchange for land holdings at another NWR in Colorado, and would not include a change in the existing Refuge administration boundary. Cumulative impacts to the Refuge associated with this alternative would be similar to Alternative A except that impacts related to a bike path, or a bike path with transportation improvements along Indiana Street, are likely to be lower. Other than the sale of the transportation corridor, management of the Refuge and the amount of land included within the administrative boundary would not change. A land exchange at either Arapaho NWR or Baca NWR would be a benefit to those refuges, but is not considered a cumulative impact at Rocky Flats NWR.

### ***Alternative D***

Alternative D would expand the administrative boundary of the Refuge but would complete a land exchange for land holdings at another Colorado refuge. section 16 would not immediately be acquired as part of this alternative. Cumulative impacts would be similar to Alternative A. Although the administrative boundary would be expanded, without the actual acquisition of land within the expanded boundary, the Service would have no control over activities in non-Service owned lands within the expanded boundary. Although it may be more likely at some point in the future that the Service could acquire lands within the administrative boundary, there would be no change to cumulative impacts for the foreseeable future.